

TAMEDIA HEAD OFFICE

Zurich, Switzerland [Shigeru Ban Architects]

2013 **Year**

Tamedia AG **Client**

Creation Holz GmbH **Structural Engineer**

Blumer-Lehmann AG **Engineered Wood Fabricator**

HRS Real Estate AG **Contractor**

Office **Program**

Inspired by traditional Japanese joinery, the intricate all-wood post-and-beam structure of this building was made possible by the precision of computerized fabrication.





The structural rhythm and mansard roof form of the building responds to the historic context of the site. The new building extends over the adjacent building, creating meeting and office spaces.

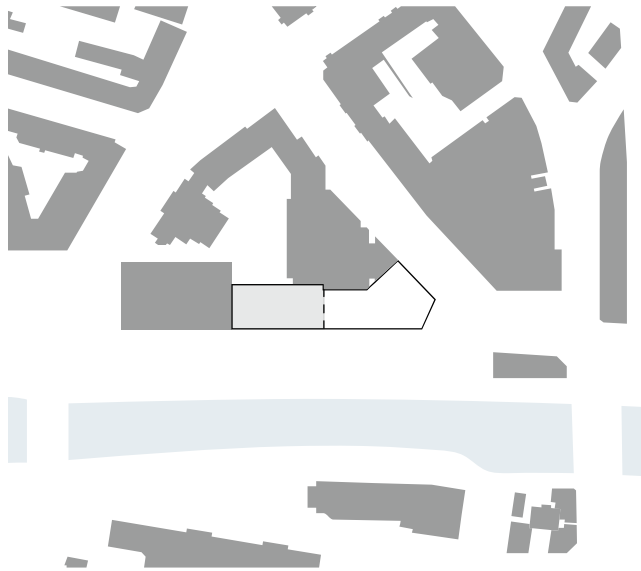
Located in the centre of Zurich, this project provides office accommodation for 500 employees of the Swiss media group Tamedia, consolidating its operations into a single urban campus. The new building replaces an existing structure, occupying the original footprint, but extending its two uppermost storeys over an adjacent structure to create a continuous street frontage of almost 50 metres facing the Sihl canal. The main axis of the building extends to the junction of Werdstrasse and Stauffacherquai, creating a new main entry for the entire Tamedia complex. The most striking feature of the building is its exposed wood structure, visible not only on the interior, but through the fully glazed double façade.

CONCEPT

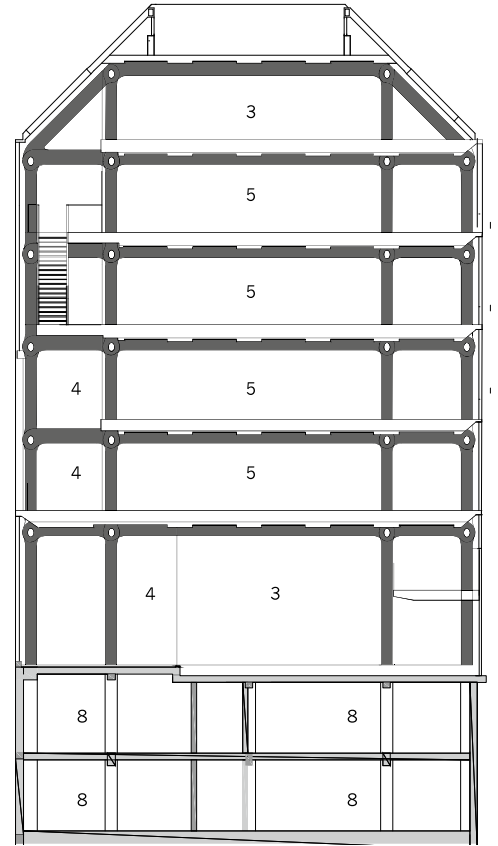
As a creative company, Tamedia wanted to provide its employees with a relaxing yet inspiring work environment that would support informal interaction and collaboration. The choice of an exposed timber structure wrapped in an envelope of glass supported these ambitions, and the use of connection details inspired by

traditional Japanese joinery techniques gives the interior the atmosphere of a domestic living room. The low embodied energy and the sequestered carbon of the 2000 cubic metres of spruce glulam incorporated in the wood structure, also contributes to Tamedia's corporate sustainability goals. The building has a low construction carbon footprint and, with its energy-efficient high-performance envelope and geo-exchange heating and cooling system, is carbon-neutral in its operations.

Accommodating the required program for a new and contemporary building within strict urban design guidelines, and constructing it on a restricted site adjacent to other fully operational buildings, presented both architectural and logistical challenges. The choice of a mansard roof form, and its extension over the adjacent building, maximized the program area within the permitted building height, while the choice of a prefabricated wood structure reduced the construction time and minimized noise and other forms of disruption to the occupants of surrounding buildings.



Site plan



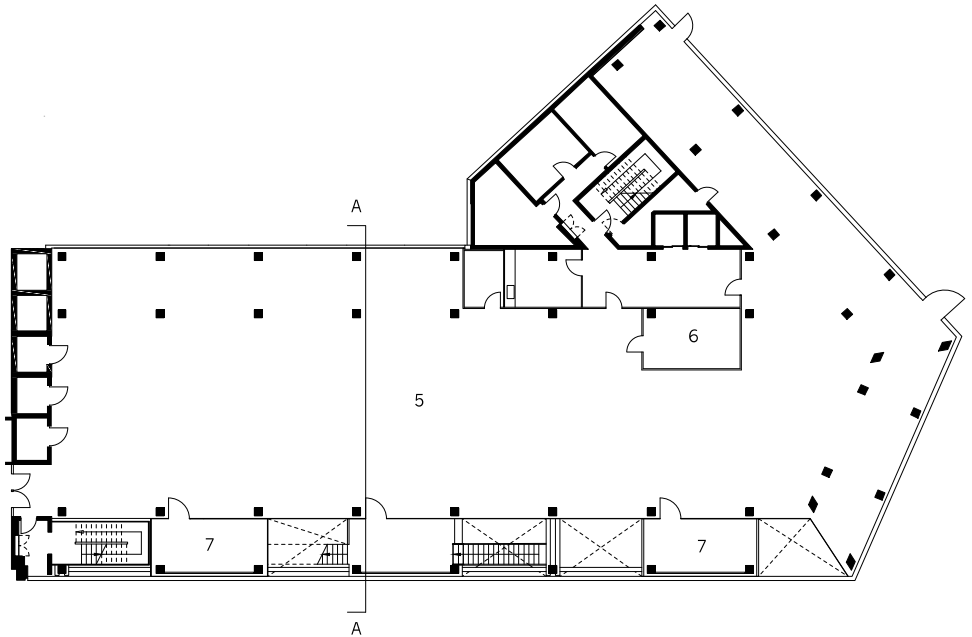
Section AA

CONSTRUCTION

The desire for a fully glazed envelope and an exposed structure in which even the connections were to be of wood, presented challenges for the thermal and structural performance of the building. These issues have been addressed with an integrated approach that involves both programmatic and technical innovation. The entire east façade of the building has been designed as a full-height double-envelope system, with the intermediate space between the outer and inner layers of the glass curtain wall containing circulation stairs and lounge areas that overlook the city. The outer glass wall is operable, enabling the enclosed seating areas to become exterior terraces when the weather permits. Thus, in addition to forming part of the overall passive ventilation and energy strategies for the building, these areas, which are conditioned using extraction air from the adjacent offices, reinforce the

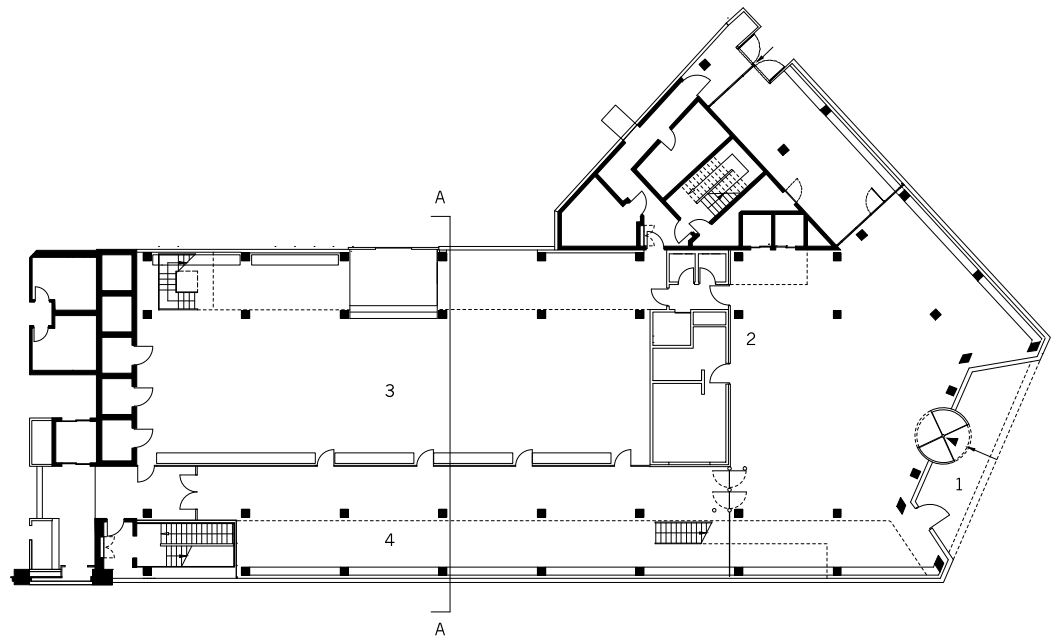
unique connection between the interior spaces of the building and its surrounding context. Special attention was given to the detailing of penetrations through the glass in order to achieve the low energy transmission levels required to conform to Zurich's strict energy performance requirements.

The main body of the building is 38.15 metres in length and 11 metres in width. It is spanned by eight structural frames set at 5.45 metres centres. Each frame consists of four equally spaced columns that extend the full 21 metre height of the building; a pair of transverse beams for each of the floors; and a series of longitudinal tie beams of oval cross section that pass through the beam pairs at each column position. Because of their oval shape, these tie beams cannot rotate, enabling them to absorb the lateral forces to which the building may be subjected, yet preventing the structural frame from deflecting.



Typical floor plan

- 1 Entrance
- 2 Front desk
- 3 Multi-purpose space
- 4 Atrium
- 5 Office space
- 6 Meeting rooms
- 7 Open/closed lounge
- 8 Technical room



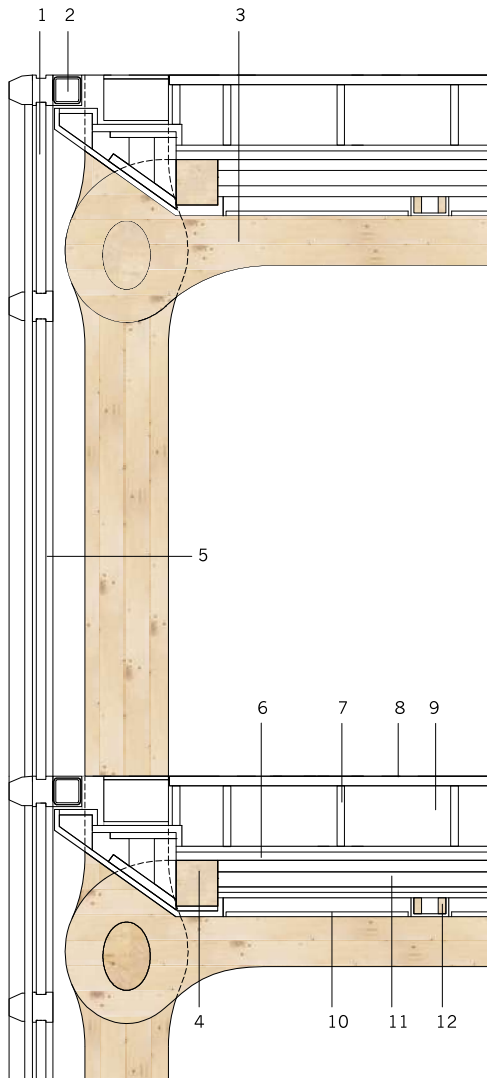
Ground floor plan



The structural timber frames were assembled on site. Once the frames were lifted into place, installation of floors and walls could begin.



Components combine to create a unique and expressive post-and-beam system.



Detail section

- 1 External shading (fabric)
- 2 Steel square tube 140mm × 140mm
- 3 Laminated timber (spruce)
- 4 Wood joist 200mm × 267mm
- 5 Triple glazing
- 6 Three-layer wood board 45mm and mineral wool 60–160mm
- 7 Steel support for raised floor
- 8 Carpet and raised floor
- 9 Equipment installing space
- 10 Cooling/heating panel
- 11 Sand 80mm
- 12 Wood joist

The elements of the frame system were CNC-milled to create a precise ‘kit of parts’. A full-size prototype was created and tested to refine the connection details and ensure that site assembly would proceed smoothly. The precision of CNC fabrication was critical to the success of this project. The wood to wood connections required great precision to achieve a tight fit; and the control of moisture content of the various wood components ensured that maximum performance would be realized over the service life of the building. To comply with Swiss fire codes and provide the required fire resistance rating, all exposed structural members were oversized by 40mm in each direction. This creates a sacrificial charring layer that will protect and maintain the structural integrity of the building for the required one-hour duration when exposed to fire.

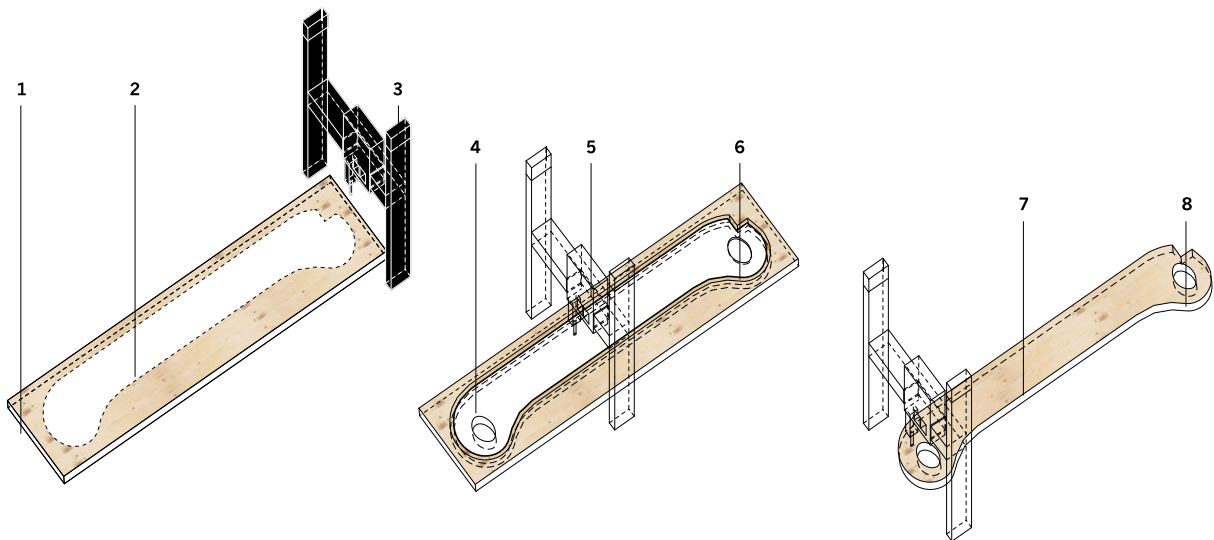
CONCLUSION

The Tamedia Head Office confirms the suitability of wood as a structural material in a high-performance office environment, where considerations of beauty and durability go hand in hand with the concern for ecology and occupant health. The success of this project both aesthetically and technically is the result of a highly sophisticated and seamlessly integrated approach to design and construction. The finely articulated structure with its curvilinear elements clearly illustrates the precision and expressive potential of digital fabrication. While the structural detailing of the building is unmistakably personal and may not lend itself to widespread replication, these underlying messages are readily transferable.



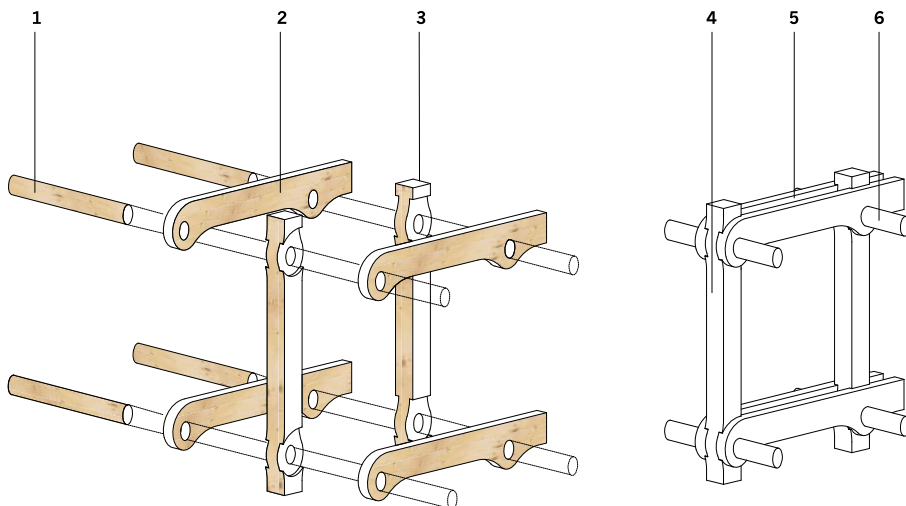
Details of precision CNC-milled components

CNC manufacturing: The CNC machine at Blumer-Lehmann AG enabled the production of a precise ‘kit of parts.’
1 Glulam panel **2** 3D model of each piece is sent to CNC machine. **3** Large-scale CNC machine **4** Precise oval holes for the columns ensure an interlocking connection. **5** CNC machine is capable of five-axis rotation to produce angles. **6** Due to the diameter of the pieces a long milling bit was used. **7** Finished pieces are checked by hand before being shipped to the construction site. **8** Specialized undercut and high detail finishing is done by hand.





The joint configuration, combined with tapered diagonal members, enables the frame to resist twisting and bending.

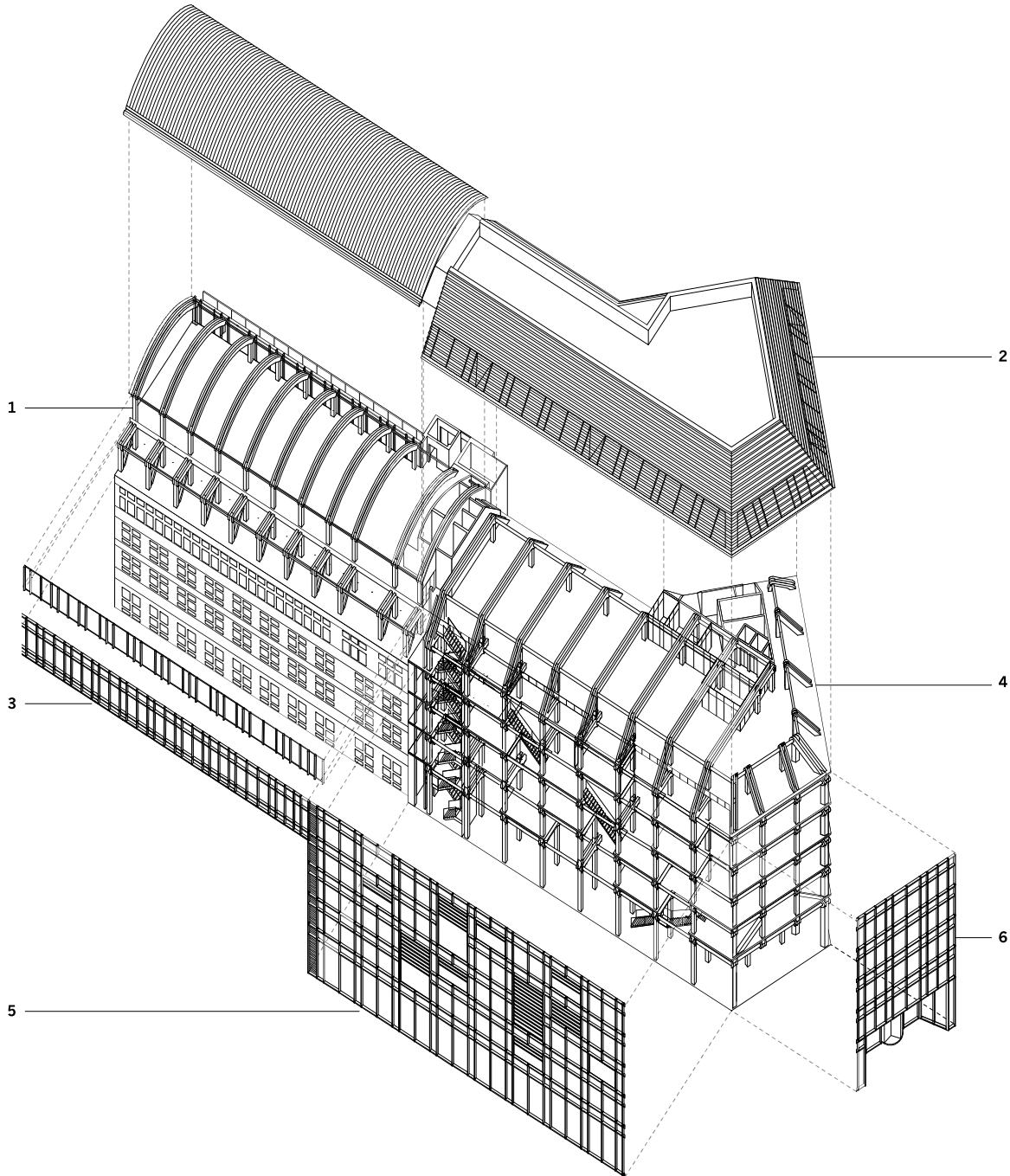


Joint assembly

1 CNC milled secondary oval beam 2 CNC milled primary beam 3 Interlocking column system 4 The column is locked into position by the beam grid 5 Primary beams distribute loads from the building 6 Oval beams lock the system in place and brace against shear forces.

Design concept

1 Existing Tamedia building **2** The mansard roof responds to the form of adjacent historic buildings. **3** Façade for extension over neighbouring building **4** Structural heavy timber frame **5** Façade for new construction **6** The entrance façade responds to the existing urban scale.





The building was designed with a double-envelope system, which reduces the energy required for heating and cooling. The intermediate space accommodates gathering areas and meeting rooms that complement the more traditional office space.